

4.13 Noise

4.13.1 Existing Conditions

4.13.1.1 Background

Noise is defined as any loud, discordant, disagreeable, or unwanted sound or sounds. The sound generated by proposed or existing facilities may become noise due to land use surrounding the facilities. When lands adjoining an existing or proposed facility contain residential, commercial, institutional or recreational uses, noise can be a matter of concern to residents or users of adjacent lands (NYSDEC, 2001).

The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present. The A-weighted decibel scale (dBA) is commonly used to measure noise levels because it has been shown to provide a good correlation with the human response to sound (Harris, 1991). The faintest sound that can be heard by a healthy ear is about 0 dBA, while an uncomfortably loud (deafening) sound is about 120 dBA.

The dBA scale describes a noise level at just one moment; however, very few noises are constant. Therefore, other ways of describing noise over more extended periods of time have been developed. The L_{eq} , or equivalent sound level, is a single value of sound which includes all of the varying sound energy in a given duration (i.e., one hour). L_{eq} levels are often used in the evaluation of vehicular traffic and construction related noise. Other noise descriptors include the statistical L_{90} and L_{10} levels. The L_{90} is the noise level exceeded 90 percent of the time and is often considered the background or residual noise level. It is representative of the lower range of noise levels without the contribution of intrusive noises, such as passing trains, cars, aircraft, etc. The L_{10} is the noise exceeded 10 percent of the time and is a measurement of intrusive noises, such as aircraft overflights.

4.13.1.2 Noise Standards, Criteria, and Guidelines

Although not applicable to the Stadium Project, the State of New Jersey Noise Control Code (N.J.A.C. 7:29-1) limits noise generated by an industrial or commercial facility, when measured at the property line of any residential use, to no greater than 65 dBA during daytime hours (7 am to 10 pm) and 50 dBA during nighttime hours (10 pm to 7 am). These limits apply to continuous noise generated by a facility, but do not include public roadway noise. The Stadium Project is defined as a commercial use under the

New Jersey Noise Control Code. Residential uses are defined as private residences and include commercial living accommodations (e.g. hotels).

The ability of the average person to perceive increases in noise has been documented by various government agencies and research institutions, such as the USEPA, Federal Highway Administration (FHWA), and the International Standards Organization (ISO). In general, an increase of 3 dBA or less is considered to be a barely perceptible change, while an increase of 10 dBA is perceived as a doubling of the sound (Bolt, Beranek and Newman, Inc, 1973).

The ISO has developed a scale for estimating community response to increases in noise levels (Table 4-23). This scale relates changes in noise levels to the degree of community response and permits direct estimation of the probable response of a community to a predicted change in noise level.

Table 4-23 Community Response to Increases in Noise Levels		
Change (dBA)	Category	Description
0	None	No observed reaction
5	Little	Sporadic complaints
10	Medium	Widespread complaints
15	Strong	Threats of community action
20	Very strong	Vigorous community action
<i>Source: ISO, 1969</i>		

4.13.1.3 Existing Noise Levels and Sensitive Receptors

The existing noise environment in the Project Area is almost completely dominated by vehicular traffic noise from the surrounding network of highways and roads, including the New Jersey Turnpike, NJ Route 3, NJ Route 120, and local roadways. Other ambient noise sources include aircraft from Teterboro and Newark Liberty International Airports, a natural gas metering station, and some natural sounds (gulls). Noise is also generated during events held at the various venues on the Sports Complex including Giants Stadium, the Continental Airlines Arena, and Meadowlands Racetrack.

An ambient noise monitoring program was conducted in 2004, which documented existing noise levels at three locations near the Meadowlands Sports Complex (NJSEA, 2004). The monitoring locations, which are depicted on Figure 4-26 and listed in Table 4-24, included:

Hotel at Sheraton Plaza Drive near N.J. Turnpike entrance ramp;
 Paterson Plank Road entrance to Continental Airlines Arena; and
 Golf Range at eastern end of Paterson Plank Road.

The three monitoring locations are in close proximity to the Stadium Project Area. Two of the three locations are adjacent to the roads which will be impacted by the Stadium Project. The third location describes an area un-impacted by the Project. Since these locations include existing traffic conditions and the existing operations of the Giants Stadium, Meadowlands Racetrack, and the Continental Airlines Arena, the data collected from these locations were used to estimate the existing ambient noise levels in the vicinity of the Project Area. Individual random sampling days were chosen and noise levels were measured with precision integrating sound level meters. The meters measured sound levels constantly during the sampling period, with subsets of the data being stored over ten minute intervals (NJSEA, 2004). Table 4-25 presents a summary of the measured noise levels at the three monitoring locations. Table 4-26 presents a summary of the measured hourly L_{eq} levels.

Table 4-24	
Distance of Noise Monitoring Locations from Project Area	
Monitoring Location	Distance from Stadium Project Area (ft)*
Sheraton Plaza Drive	2,500
Paterson Plank Rd Arena Entrance	3,500
Golf Range at Paterson Plank Rd	4,500
*Distance from center of site.	



⊕ NOISE MONITORING AND ANALYSIS LOCATION

● NOISE RECEPTORS



REFERENCE: KEYSTONE AERIALS, 2006; NJSEA, 2004; NJSEA, 2005

NEW MEADOWLANDS STADIUM PROJECT



NEW JERSEY SPORTS AND
EXPOSITION AUTHORITY

NOISE MONITORING AND ANALYSIS LOCATIONS

Date
OCT 2006

Scale
1"=1000"

Figure No.
4-26

Table 4-25 Measured Ambient Noise Levels During Monitoring Periods										
Monitoring Location	Measured Noise Levels (dBA)									NJ Noise Control Code Limit (dBA)
	Peak Weekday PM Period (4 pm-6 pm)			Peak Weekday PM Period (6 pm-8 pm)			Saturday Event (12 pm-4 pm)			Daytime (7 am-10 pm)
	L _{eq}	L ₁₀	L ₁₀	L _{eq}	L ₁₀	L ₁₀	L _{eq}	L ₁₀	L ₁₀	–
Sheraton Plaza Drive	63	60	65	65	62	66	60	56	62	65
Paterson Plank Road Arena Entrance	58	48	60	54	49	57	51	44	53	65
Golf Range at Paterson Plank Road	56	53	57	56	53	58	55	52	56	65
Source: NJSEA, 2004										

Table 4-26 Measured Hourly L_{eq} Levels								
Monitoring Location	Measured Sound Levels							
	Peak Weekday PM Period		Peak Weekday Event		Saturday Event			
	4pm-5pm	5pm-6pm	6pm-7pm	7pm-8pm	12pm-1pm	1pm-2pm	2pm-3pm	3pm-4pm
Sheraton Plaza Drive	63	63	67	63	60	59	60	60
Paterson Plank Rd Arena Entrance	52	61	55	53	53	50	51	50
Golf Range at Paterson Plank Rd	56	55	56	56	54	55	55	55
Source: NJSEA, 2004								

The highest noise levels were measured during the weekday periods. The noise levels during Saturday events were consistently lower than those measured on weekdays at each location. Maximum ambient levels (L_{max}) at all locations were in the range of 80 to 84 dBA due to passing aircraft and trucks. As shown in Table 4-25, the measured L_{eq}

noise levels were highest at the Sheraton Drive location, the location closest to the Project Area.

According to the NMJC Existing Land Use Map (Figure 4-27), there are no residential uses or other sensitive noise receptors, such as hospital or schools within 0.8 miles of the Project Area. The closest residential area is 0.8 miles away from the site, which is in the Town of Secaucus (Oak Lane and Acorn Road) and is separated from the Project Area by the New Jersey Turnpike and the Hackensack River. The Secaucus High School located on Mill Ridge Road is approximately 1.2 miles to the southeast of the Project Area. The Meadowlands Hospital Medical Center located on Meadowlands Parkway is approximately 1.1 miles south of the Project Area. Several commercial living accommodations are located near the Project Area and include:

- Sheraton Hotel – Route 3 East Service Road, East Rutherford;
- Homestead Suites – Route 3 East Service Road, East Rutherford;
- Hampton Inn – Paterson Plank Road, East Rutherford;
- EconoLodge – Washington Avenue, Carlstadt;
- Red Roof Inn – Meadowlands Parkway, Secaucus;
- Meadowlands Plaza Hotel – Wood Avenue, Secaucus; and
- Racetrack Dormitory – Paterson Plank Road, East Rutherford.

The location of these facilities is shown on Figure 4-26. In addition, a future hotel is proposed as part of the Meadowlands Xanadu Redevelopment Project. This hotel is proposed to be located north of the Continental Airlines Arena, approximately 500 feet east of the Project Area.

4.13.2 Impacts and Mitigation

4.13.2.1 Construction Noise

The construction of the New Meadowlands Stadium Project will involve the following general phases:

- Site preparation;
- Excavation;
- Foundation laying (without pile driving);
- Foundation activities (with pile driving);
- Building construction; and

Exterior finishing and cleanup.

The equipment utilized will differ from phase to phase. In general, heavy equipment (bulldozers, dump trucks, cement mixers, cranes) will be used during excavation, foundation laying, and demolition activities. Construction noise is primarily generated by the diesel engines which power construction equipment and from foundation activities. Pile driving typically will generate the greatest noise during construction activities. Noise levels of some typical construction equipment are presented in Table 4-27.

Table 4-27 Noise Levels of Major Construction Equipment	
Equipment Type	Noise Level at 50 Feet (dBA)
Pile Drivers	105
Trucks	91
Front Loaders	79
Graders	85
Bulldozers	80
Pickup Trucks	60
Backhoes	85
Concrete Mixers	85
<i>Source (BBN, 1971; NYSDEC, 1974; NYPA, 1987)</i>	

Using the typical noise levels generated by major construction equipment, an average noise value can be estimated for each phase of the construction of the New Meadowlands Stadium Project (BBN, 1971). Each construction phase will involve various pieces of construction equipment in varying proportion based on the phase of construction. The average noise level value at an approximate distance of 50 feet from each activity is presented in Table 4-28.

Table 4-28 Typical Site Average Noise Levels At 50 Feet from the Construction Activity (dBA)	
Construction Phase	Noise Level at 50 Feet (dBA)
Site clearing	84
Excavation	89
Foundations (without pile driving)	78
Foundation Activities (with pile driving)	105
Building construction	85
Exterior finishing and cleanup	89
<i>Source adapted from: BBN, 1971</i>	

The Project Area is approximately 270 acres in size. The actual sound levels that will be experienced offsite will be a function of distance from the noise source. As such, no one single area will be exposed to the same sound levels over an extended period of time during the construction phases as different parts of the site are developed.

Construction noise levels resulting from the Stadium Project were estimated for the three noise monitoring locations, commercial living accommodations (racetrack dormitory and nearby hotels), and the closest residential area using the average noise level for each construction activity, the distance from the Project Area (Table 4-24), and a noise attenuation factor of 6 dB(A) per doubling of distance (MC² System Design Group, 2006). To determine the future noise levels at each receptor location (noise monitoring locations, commercial living accommodations, and residential areas) during construction, the additive effects of the construction noise combined with the background noise in each location was considered. According to the USEPA's "Protective Noise Levels" guidance, the difference between the construction noise associated with the Stadium Project and the background noise levels determines the additive affect of the noise. For example, if the construction noise is 1 dB or less below the background noise levels in a receptor location, it will result in a 3 dB increase in background noise levels (NYSDEC, 2001). If the construction noise is more than 10 dB less than the background noise levels, it will have no effect on the background noise levels. Conversely, if the construction noise is 1 dB or less above the background noise levels the future noise levels will be 3 dB greater than the construction noise. No existing background noise data was available for the seven commercial living accommodations or the closest residential area; therefore, background data from nearby

monitoring locations within similar background noise sources (i.e. roadways) were used. The projected combined background noise and construction noise level at each receptor location is presented in Table 4-29.

The projected construction noise levels at the studied locations are generally in the range of, or below, existing daytime L_{eq} noise levels, except for pile driving activities (Table 4-29). As a result, the estimated future noise levels are generally only 1 or 2 dB greater than the existing background noise levels. The temporary pile driving during the first part of construction of each proposed building (i.e. Stadium, Giants Training Facility, Ancillary Development) would be the loudest activity and would result in noise levels 1 to 23 dB higher than existing background noise levels at these locations.

The closest residential area is located 0.8 miles from the Project Area and is separated from the Project Area by the New Jersey Turnpike and the Hackensack River. The noise from pile driving activities would be approximately 66 dBA at the residential area located 0.8 miles from the Project Area and may cause modest temporary disturbances to this residential area. In addition, the projected sound levels presented in Table 4-29 are estimated outdoor noise levels. A building (house) would provide significant attenuation for those who are indoors. Sound levels can be expected to be up to 27 dBA lower indoors with the windows closed (USEPA, 1974).

Although the racetrack employee dormitory and hotels are located within a mile of the Project Area, these facilities do not represent typical residential uses. Peak occupancy of hotels and the dormitory usually occurs in the nighttime hours when there would be no construction activities occurring.

The equipment utilized during each phase of construction is not generally operated continuously, nor is the equipment always operated simultaneously. There will, therefore, be times when no equipment is operating and noise will be at ambient levels. Functional mufflers will be maintained on all equipment to mitigate and reduce exhaust noise. In addition, pile driving activities will be limited to the daytime hours of 7am to 7pm.

Table 4-29

Projected Combined Background Noise and Construction Noise Levels at Receptor Locations

Receptor Location	Existing Measured Daytime Leq ^a	Distance to Receptor (feet) ^b	Projected Combined Construction Noise Levels and Background Noise Levels ^f					
			Site Preparation	Excavation	Foundation Activities with Pile Driving	Foundations without Pile Driving	Building Construction	Exterior Finishing and Cleanup
Sheraton Plaza Drive	59-67	2,500	60-67	60-67	71-72	59-67	60-67	60-67
Paterson Plank Road Arena Entrance	50-61	3,500	52-61	54-62	68-69	51-61	52-61	54-62
Golf Range at Paterson Plank Road	54-56	4,500	55-56	55-57	66	54-56	55-56	55-57
Sheraton Hotel	59-67 ^c	2,000	60-67	61-67	73-74	59-67	60-67	61-67
Homestead Suites	59-67 ^c	2,300	60-67	61-67	72-73	59-67	60-67	60-67
Hampton Inn	50-61 ^d	3,000	52-61	55-62	69-70	51-61	53-61	55-62
Econolodge	50-61 ^d	3,200	52-61	55-62	69-70	51-61	53-61	55-62
Red Roof Inn	59-67 ^c	4,600	59-67	60-67	66-70	59-67	59-67	60-67
Meadowlands Plaza Hotel	59-67 ^c	5,100	59-67	59-67	65-69	59-67	59-67	59-67
Racetrack Dormitories	50-61 ^d	2,000	54-62	58-62	73	51-61	55-62	58-62
Closest Residential Area	54-56 ^e	4,200	55-56	56-57	66	54-56	55-57	56-57

^a Range of measured noise levels during the monitoring programs at Sheraton Plaza Drive, Paterson Plank Road Arena Entrance, and Golf Range at Paterson Plank Road. Other locations assigned background from monitored locations (See Table 4-26)

^b Distance from center of Project Area

^c Ambient data from Sheraton Plaza Drive location

^d Ambient data from Paterson Plank Road Arena Entrance location

^e Ambient data from Golf Range at Paterson Plank Road

^f Projected combined existing noise levels and construction-related noise (estimated resultant noise levels)

During construction, pile driving activities for the new Stadium may take place over a period of 12 to 18 months. Additional pile driving activities will be necessary for the other buildings, including the Giants Training Facility and Ancillary Development. Considering the projected combined background noise and construction noise levels in Table 4-29, the existing average and maximum ambient noise levels, and the lack of adjacent residential development, no significant long-term noise impacts are anticipated during construction in the Project Area.

4.13.2.2 Operational Noise

The new Stadium and Giants Training Facility will replace existing facilities and are therefore not considered new noise sources. The operation of these replacement facilities are expected to have noise levels similar to the existing stadium and should not significantly affect the existing noise levels in the vicinity of the Project Area presented above in Tables 4-25 and 4-26.

The operation of the proposed Ancillary Development, including vehicle parking, heating, ventilating, and air conditioning (HVAC) systems, and emergency generators will be additional noise sources. This additional equipment will be new, efficient, and will be evaluated during detailed design of these facilities with regard to equipment placement and need to incorporate noise control such as shielding, barriers, screening, etc. to minimize noise impact from the additional equipment.

4.13.2.3 Mobile Source Noise

The predominant noise source in the vicinity of the Project Area is the traffic on the adjacent network of highways (New Jersey Turnpike, Route 120, and Route 3) and local streets (Paterson Plank Road). Noise levels associated with vehicular traffic are a function mainly of traffic speed, vehicle mix (automobile, medium trucks, heavy trucks) and volume. The Traffic Study prepared for the Stadium Project, which evaluated the potential impacts of the Project combined with other planned development and transportation improvement projects, concluded that the Project will not contribute to a significant impact to the local roadway network (Appendix C). It is anticipated that vehicular traffic from the Stadium Project will not result in significant noise impact as well. As such, the Stadium Project is also not anticipated to have a significant impact on existing noise levels in the surrounding area. Therefore, no mitigation is needed or proposed.